

■ GEOTECHNICAL AND  
TUNNEL ENGINEERING



**Engineers you can trust**



The improvement of transport connections and development of industrial and residential areas requires the extension or renewal of infrastructure.

It includes road and rail, water supply and wastewater treatment, oil and gas supply and hydroelectric power plants.

When constructing and operating these infrastructure projects, underground structures such as tunnels, galleries and shafts have considerable advantages over above-ground measures, such as the reduction

of visual impact and emissions (vibrations, noise, air) and more efficient land use.

We deliver tailor-made solutions in all design phases, from feasibility studies to permit application design and implementation planning.

In addition to the technical planning, environmental aspects during construction are also considered through logistics concepts for the supply and disposal of construction site materials and the planning of transport routes.

## ABOUT US

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## COMPREHENSIVE DESIGN

We support you in the realization of infrastructure projects. Our long-term experience and the resulting expertise in this area guarantee integrated and comprehensive solutions. Tunnel design is usually closely linked to other engineering fields, for example, a road tunnel project requires the design of a drainage system, the consideration of environmental aspects, the integration to the road network, as well as services in traffic engineering, engineering geology, geotechnics, and electrical and mechanical engineering. We are able to cover this wide range of services to the highest quality by working together with the other specialist disciplines within the BERNARD Gruppe.

## GEOLOGY IN CIVIL ENGINEERING

By assessing the geological conditions in a project area, we are able to determine the required excavation method and tunnel support measures with our tunnel design engineers. We prepare mapping, concepts, tender documents and supervision for exploration works. The BERNARD Gruppe's portfolio also includes the documentation of hydrological conditions and the preparation of expert opinions in the fields of geology and hydrology.

## INNOVATIVE

For underground structures, we evaluate the measures required during excavation and support, as well as for the completed structure's final lining or shaft support using state-of-the-art software solutions. The geotechnical analysis includes the design of retaining structures, pile foundations, ground improvement, drainage systems and groundwater control as well as flow calculations.

## OUR SERVICES

- Overall planning, including tender documents and the procurement process up to contract award
- Geotechnical measurements and analyses
- Construction and project management
- Site logistics, construction scheduling
- On-site geological surveys
- Tunnel inspections
- Site supervision
- Risk analysis



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